

RT375VN INDEXER

**INSTALLATION
OPERATION AND
MAINTENANCE
MANUAL**

PRECAUTION CONTENTS

PRECAUTION CONTENTS

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Precautions.....	P-2.0

SAFETY WARNINGS AND PRECAUTIONS

SAFETY WARNINGS

WARNING:

Do not attempt to install operate or perform maintenance on this product until you have read and completely understood the contents of this manual. For assistance call or contact:

SMW Systems, Inc.
9828 S. Arlee Avenue
Santa Fe Springs, Ca. 90670
Phone: 1-800-423-4651
1-562-949-7991
FAX: 1-562-864-4391

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4. Do not install or attempt service while the electrical power (110 VAC) is "ON" to the control, turn power "OFF" and disconnect power cable as first step when unit is dis-assembled for service or maintenance.
5. Secure loose clothing - neckties - and long hair to prevent engagement of moving parts, for example - the fan in the control box or rotating motor shaft and coupling.
6. Connect only 110 VAC (7-15 Amps) to servo control main power supply. The control will be severely damaged if 220 VAC is connected to the control.
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RT375 - 25 ft-lb.

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SPECIFICATIONS

RT 375VN SPECIFICATIONS

SPECIFICATIONS

ACCURACY (SEC)	+/- 7.5
REPEATABILITY (SEC)	2
WORM/WORMWHEEL RATIO	90:1
SPINDLE RUNOUT TIR (IN)	.0004
FACEPLATE RUNOUT TIR (IN)	.001
BRAKE TORQUE (FT-LBS)	725
GEAR RATIO TO MOTOR	180:1
WEIGHT W/MOTOR (LB)	610
SPINDLE NOSE	A-8
THRU HOLE (IN)	3.06

PRE-LOADED TAPERED ROLLER
SPINDLE BEARINGS
HARDENED ALLOY STEEL WORM
BRONZE WORMWHEEL

PERMISSIBLE WORKPIECE LOADS

VERTICAL FACEPLATE	460 LBS
HORIZONTAL FACEPLATE	1160 LBS
OFF CENTER INDEXING LOAD W/SMW CONTROL	25 FT-LBS

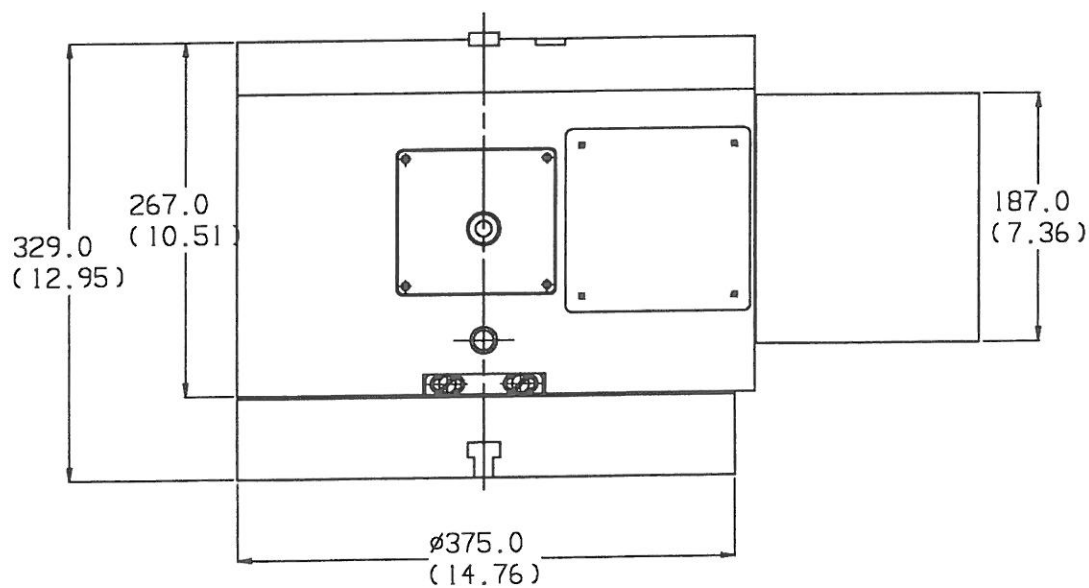
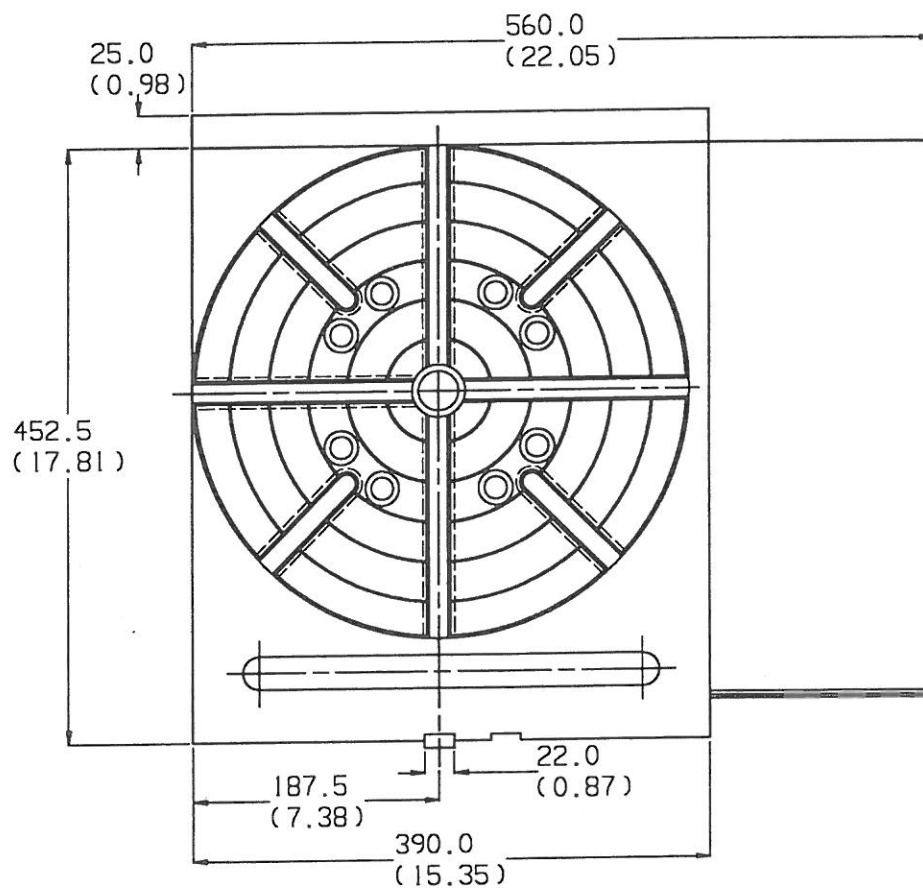
MACHINING FORCES

RADIAL TORQUE	700 FT-LBS
RADIAL LOAD AT FACEPLATE ON CENTER-LINE	9640 LBS
RADIAL LOAD ONE FOOT FROM FACEPLATE ON CENTER-LINE (UNSUPPORTED)	2780 LBS
AXIAL THRUST	4650 LBS

(s.f. 10)

SPECIFICATIONS

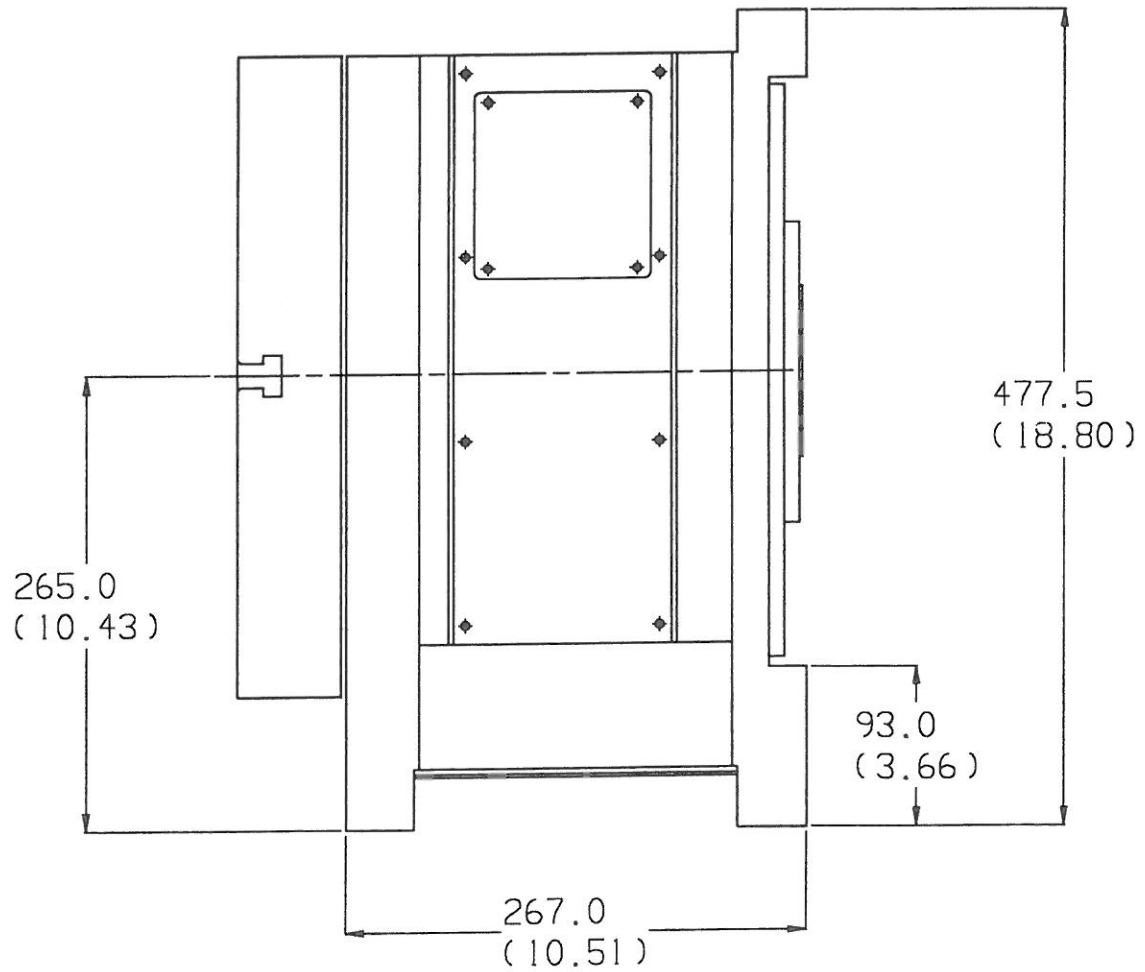
RT375 - TOP VIEW AND FRONT VIEW



DIM: MM/(INCH)

SPECIFICATIONS

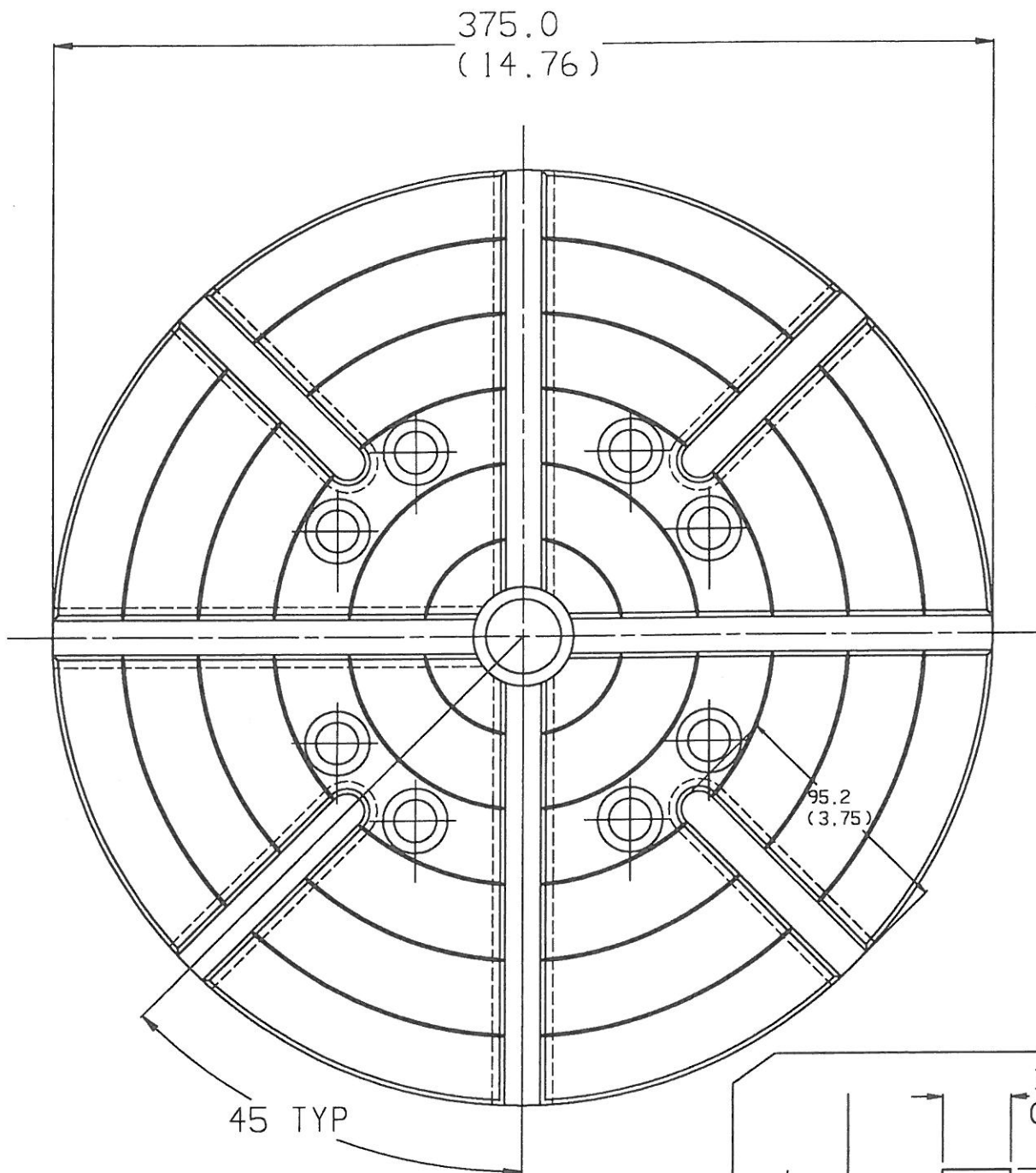
RT375 - SIDE VIEW



DIM: MM/(INCH)

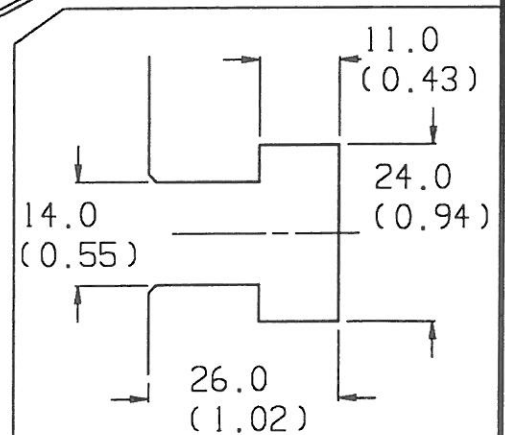
SPECIFICATIONS

RT 375VN FACEPLATE



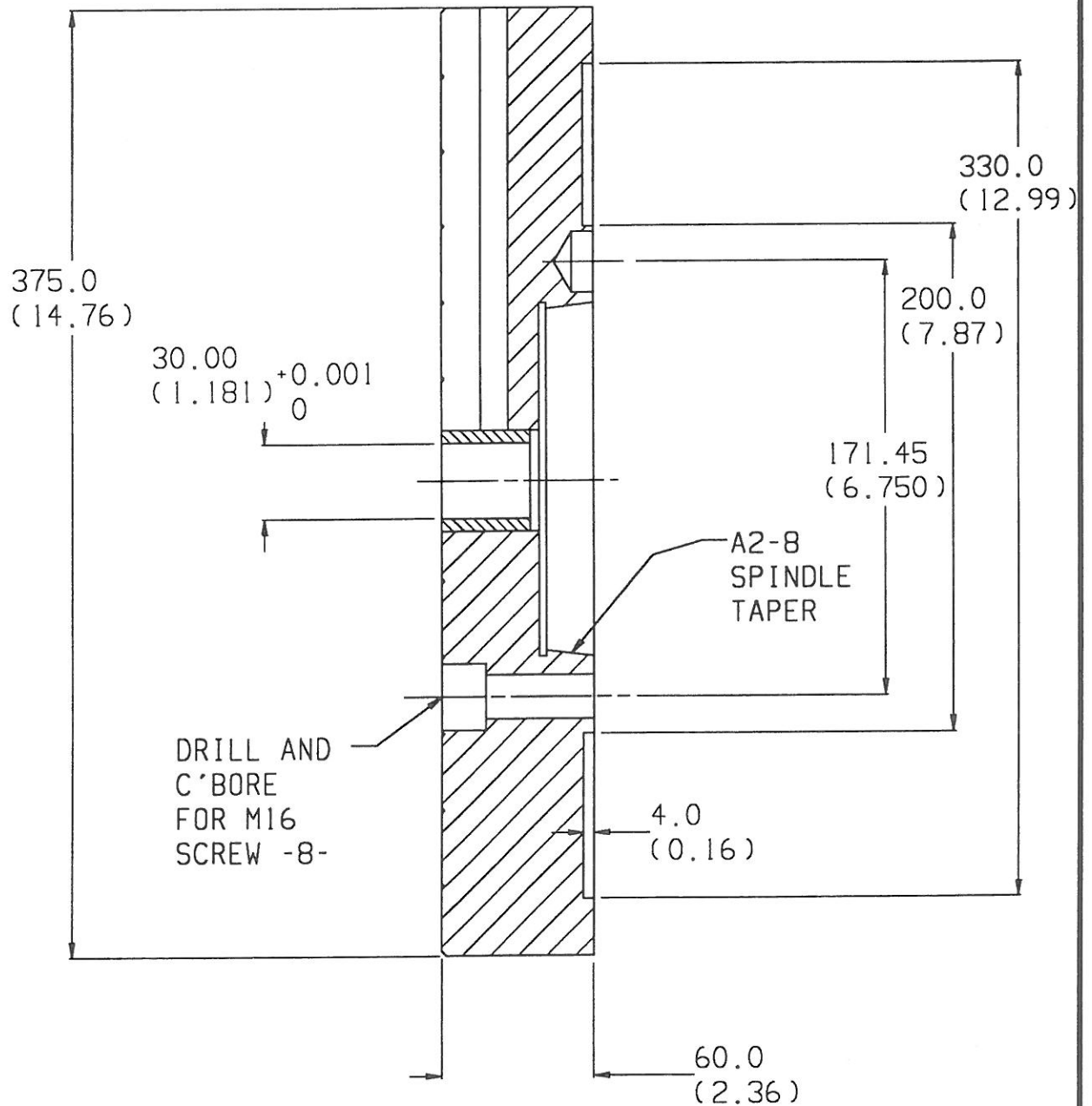
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T-SLOT DIMENSIONS



SPECIFICATIONS

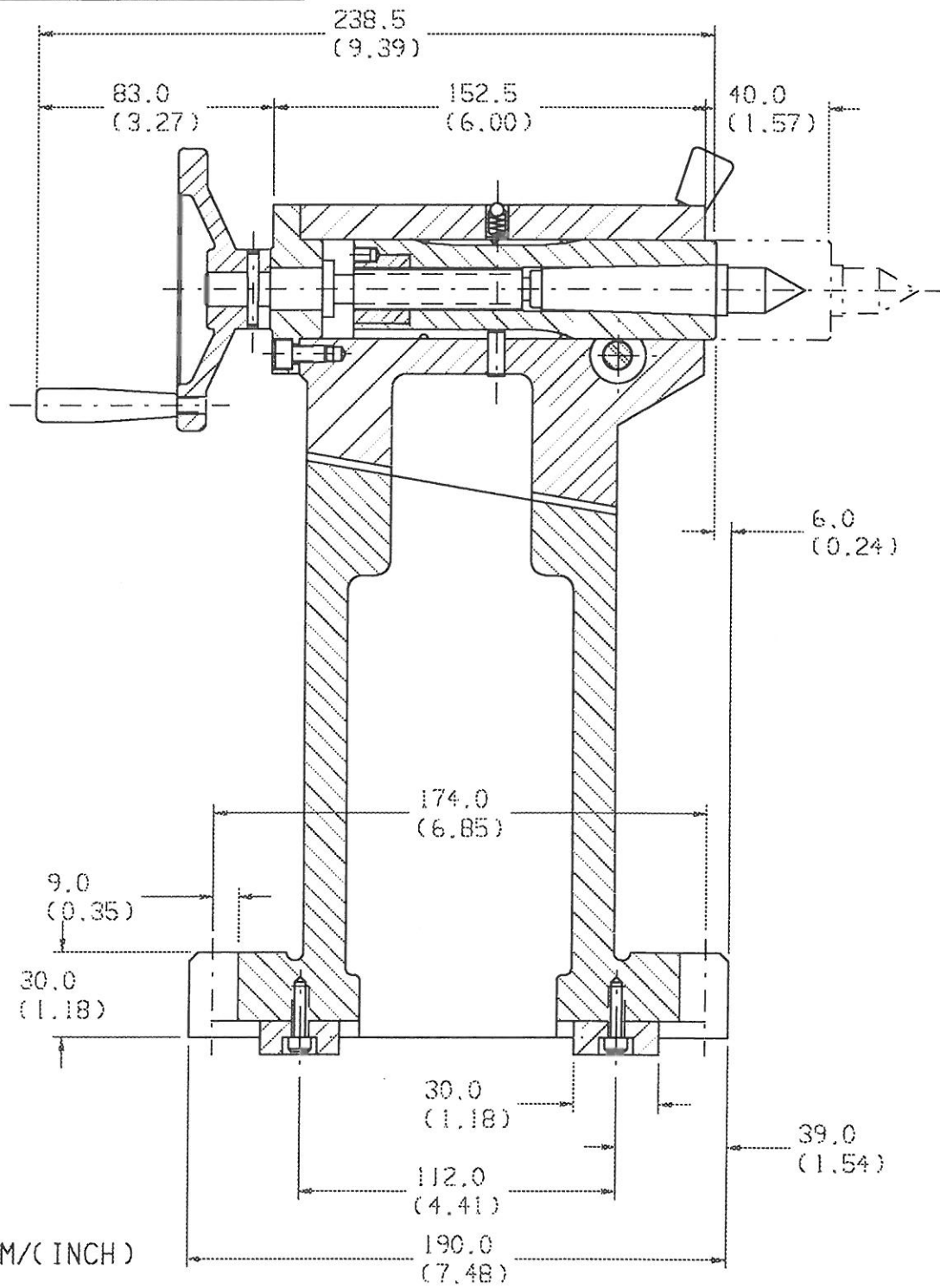
RT 375VN FACEPLATE



DIM: MM/(IN)

SPECIFICATIONS

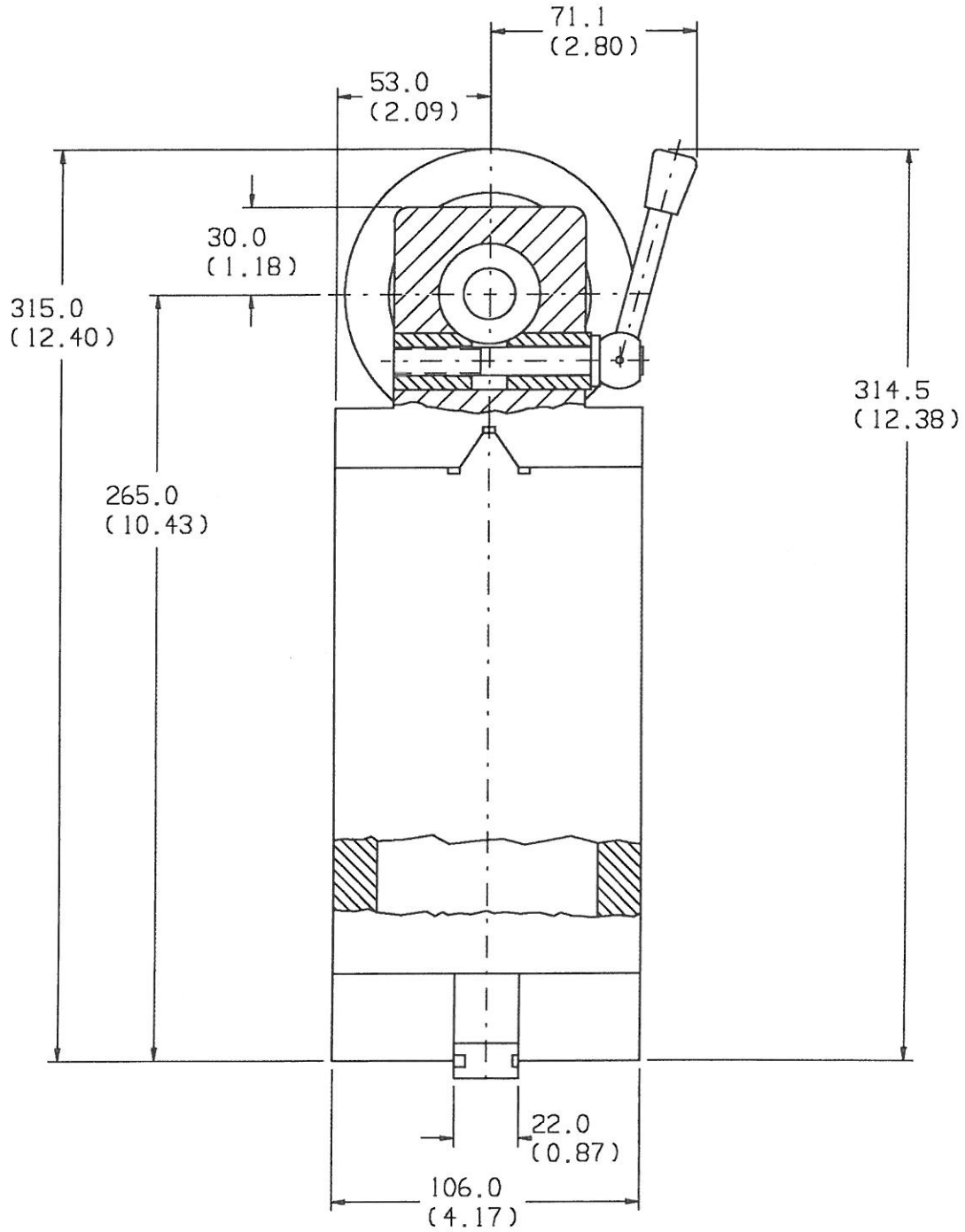
DIMENSIONS - RT375 VN TAILSTOCK



DIM: MM/(INCH)

SPECIFICATIONS

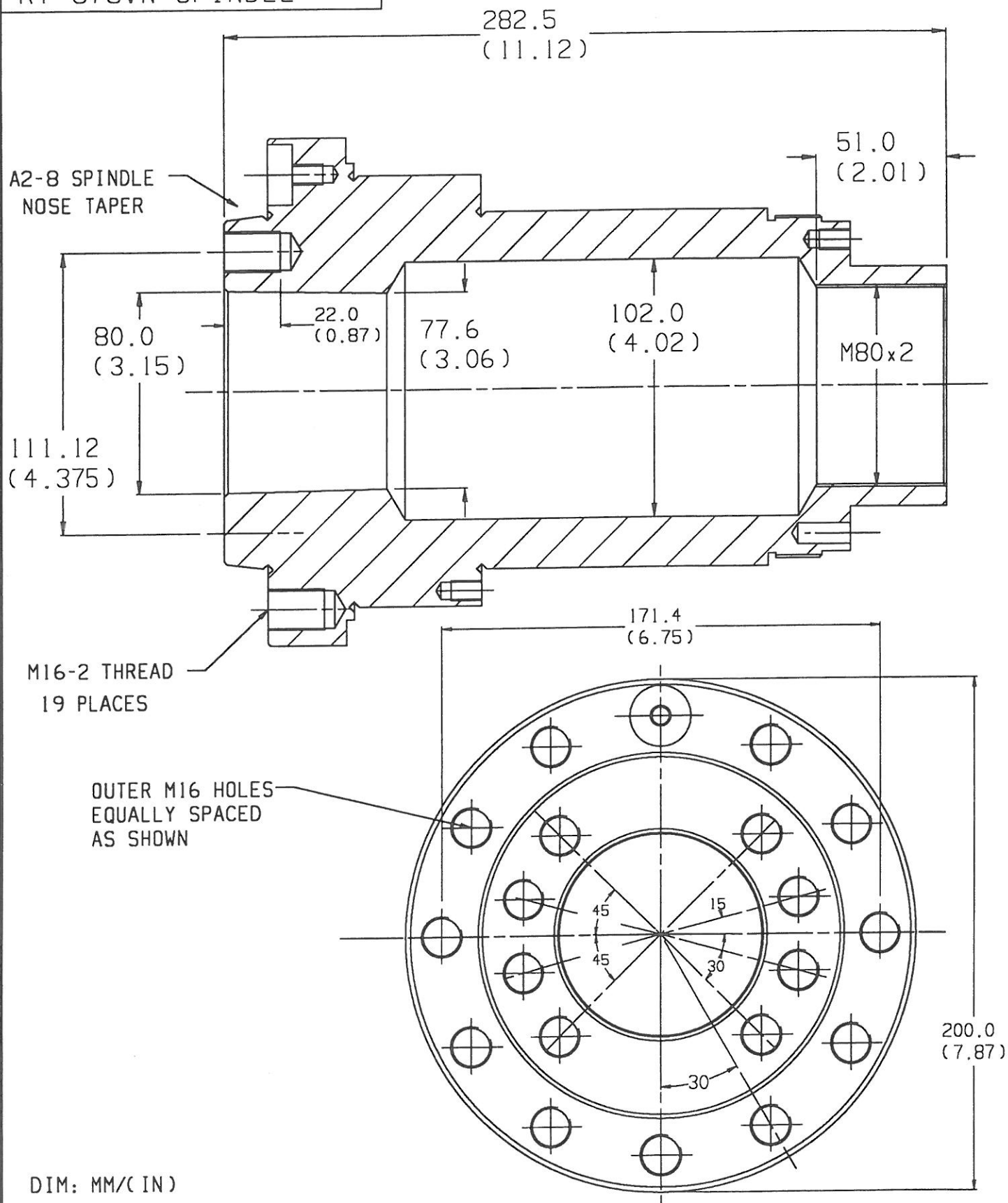
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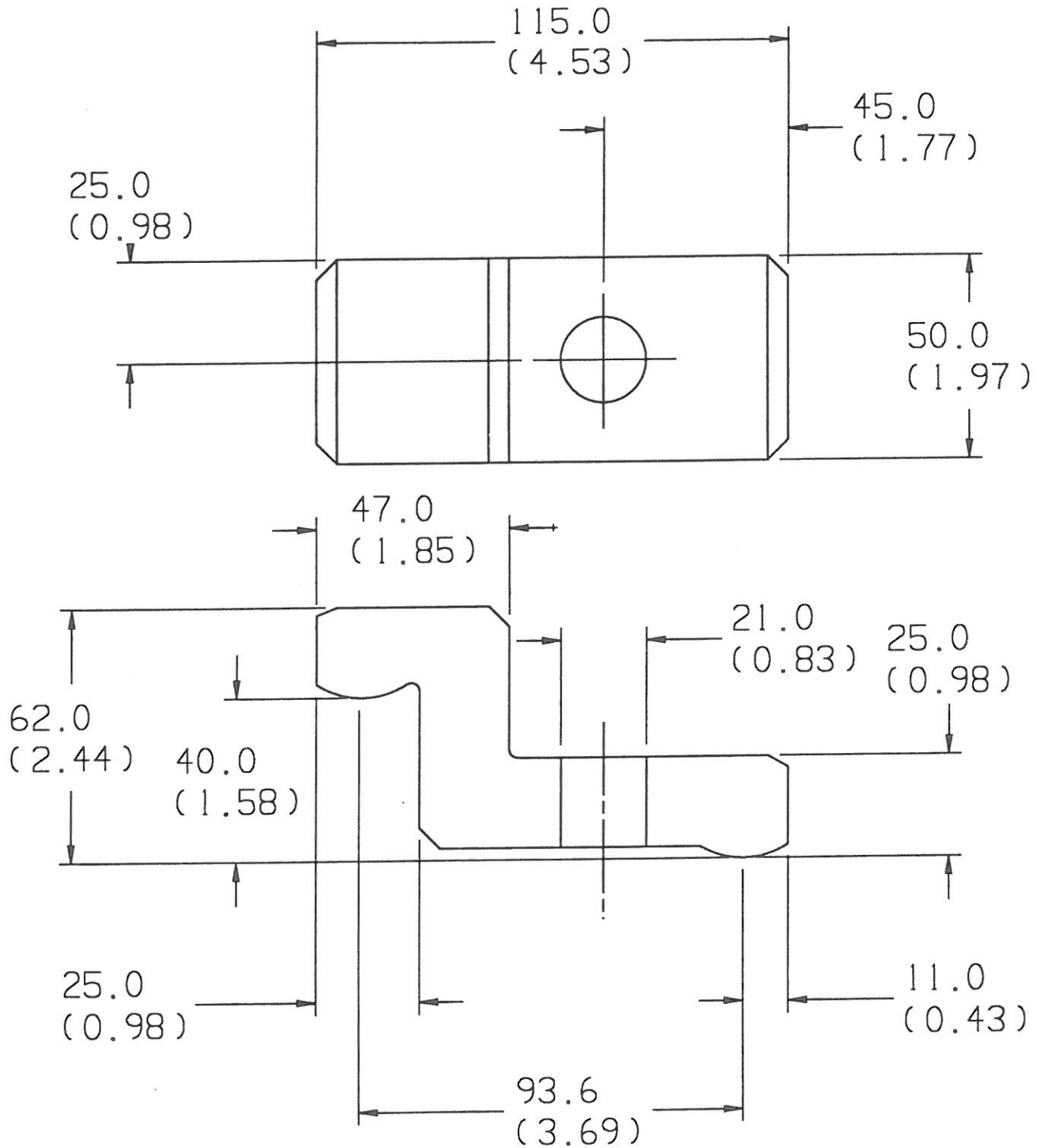
SPECIFICATIONS

RT 375VN SPINDLE



SPECIFICATIONS

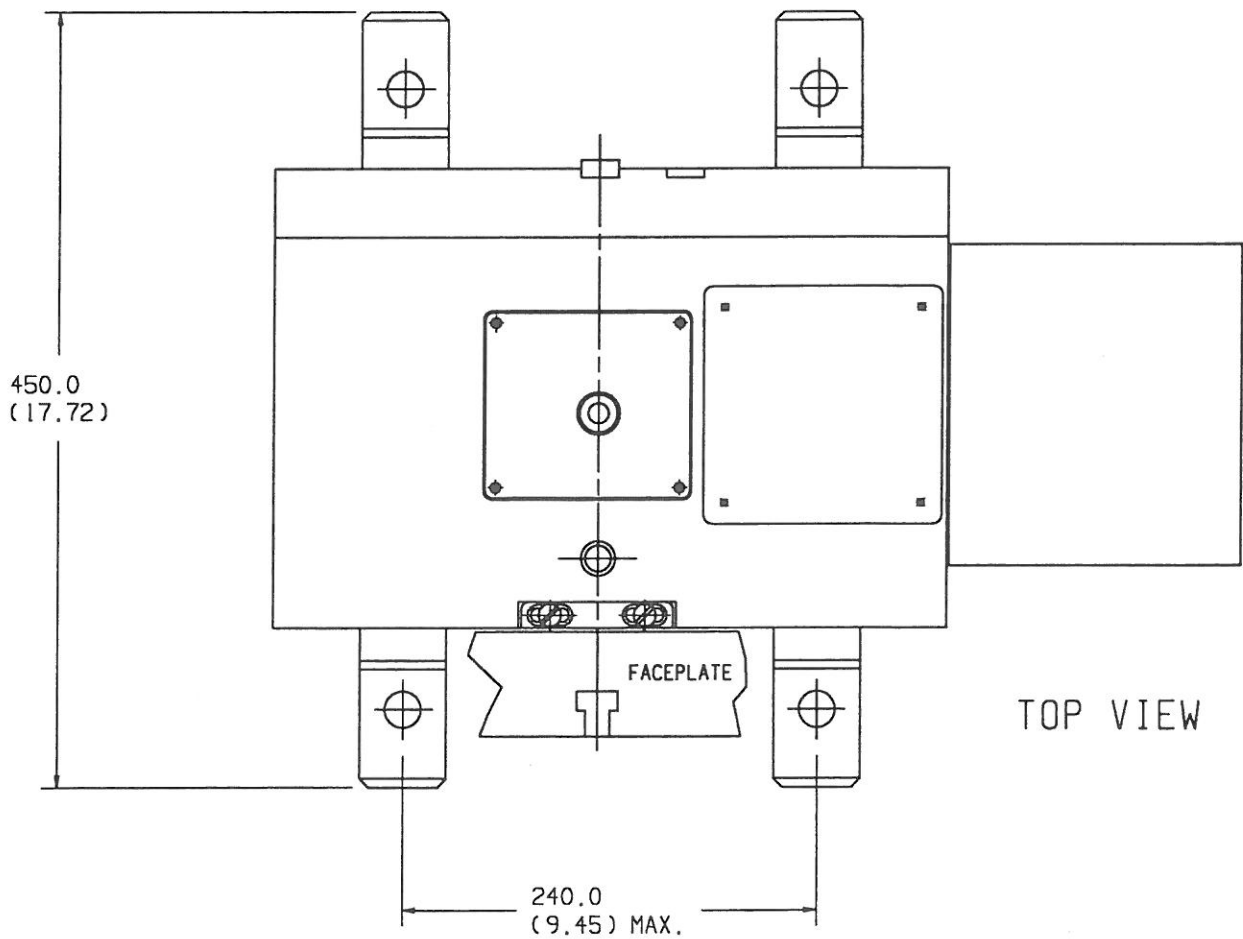
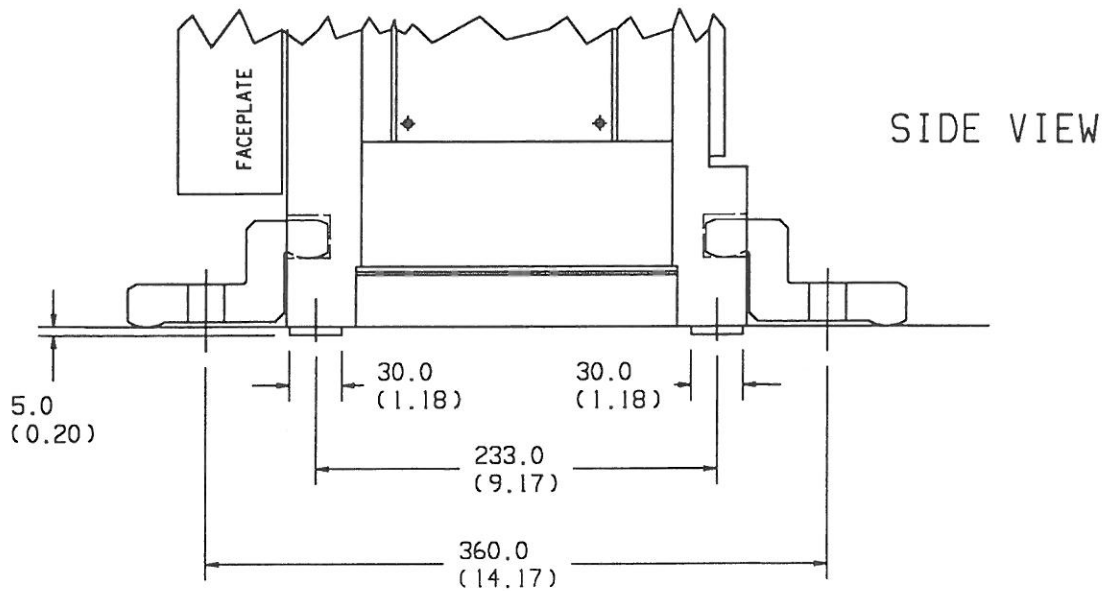
RT375 - CLAMP DIMENSIONS



DIM: MM/(INCH)

SPECIFICATIONS

RT375 - CLAMP LAYOUT

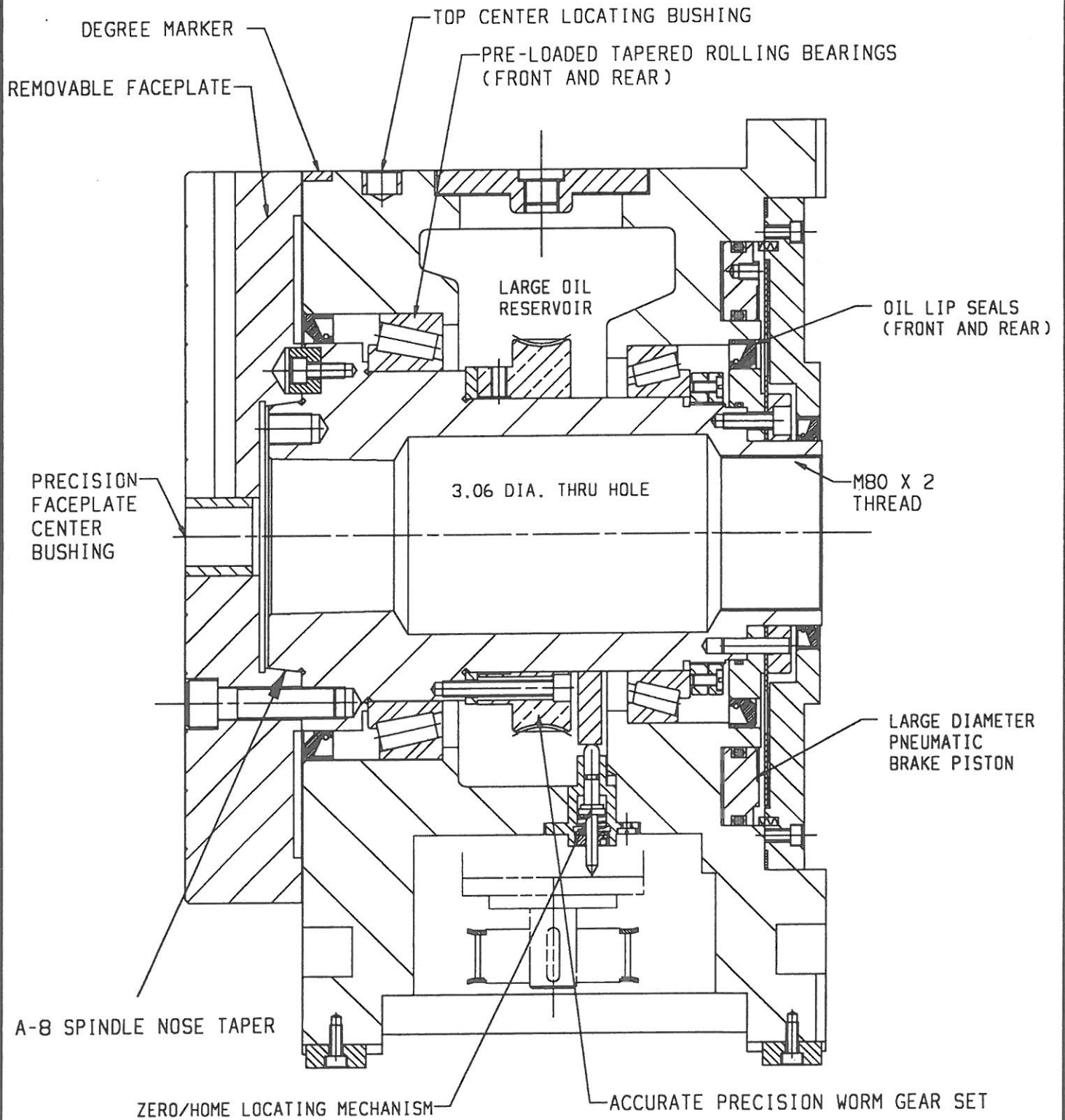


DIM: MM/(INCH)

SPECIFICATIONS

FEATURES - RT 375VN STANDARD

VERTICAL OR HORIZONTAL ORIENTATION



INSTALLATION CONTENTS

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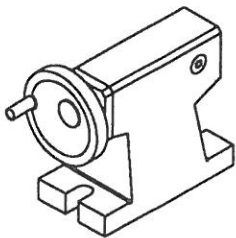
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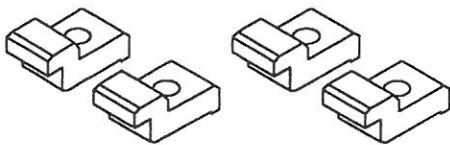
RT 375 ITEMS IN SHIPMENT

INDEXER ITEMS INCLUDED WITH THE SHIPMENT:

1. RT 375 INDEXER
2. T-SLOTTED FACEPLATE
- SHIPPED MOUNTED TO INDEXER
3. TAILSTOCK
4. TOE CLAMPS (4)

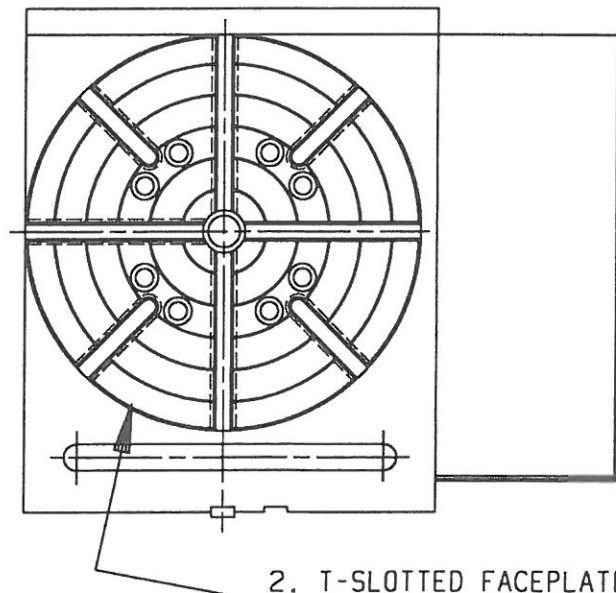


3. TAILSTOCK - OPTIONAL



4. TOE CLAMPS (4)

1. RT 375 INDEXER



2. T-SLOTTED FACEPLATE

INSTALLATION

INSTALLING RT375 ON MACHINE TOOL TABLE

THE RT375VN CAN BE MOUNTED HORIZONTALLY OR VERTICALLY ON THE MACHINE TOOL TABLE.

THE INDEXER IS SUPPLIED WITH .866 (22 MM) WIDE BASE KEYS AS STANDARD. GENERALLY, THE INDEXER IS POSITIONED IN THE CENTER T-SLOT ON THE MACHINE TOOL TABLE.

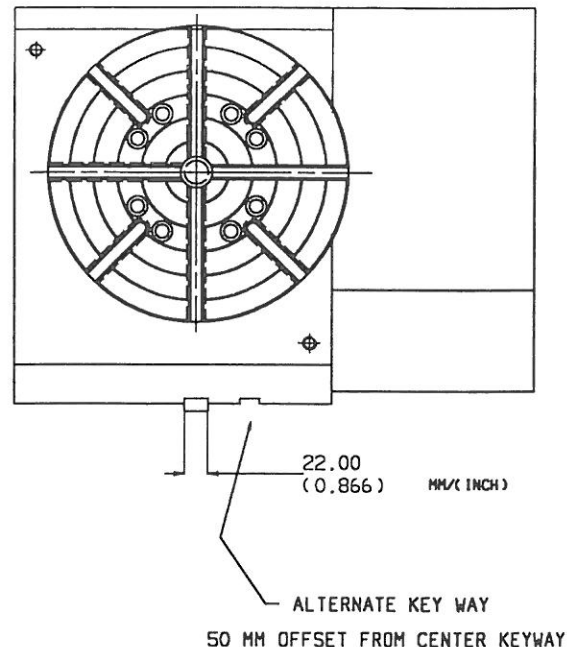
THE TAILSTOCK ALSO HAS .866 INCH KEYS.

MAINTAIN INDEXER AND TAILSTOCK ALIGNMENT BY USING BACKSIDE OF MACHINE TABLE T-SLOT AS GUIDE WAY WHEN SECURING INDEXER AND TAILSTOCK IN POSITION ON MACHINE TABLE.

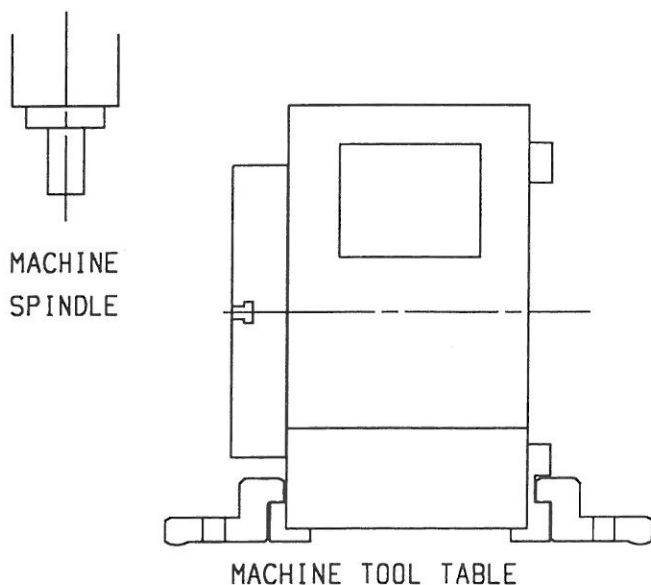
SHOULD SMALLER KEYS BE REQUIRED, IT IS SUGGESTED THAT ONLY THE SIDE TOWARD FRONT OF MACHINE TOOL BE MACHINED IF POSSIBLE. THIS WAY ACCURATE ALIGNMENT WITH TAILSTOCK AND INDEXER CAN BE MAINTAINED WHEN USING THE BACKSIDE OF THE CENTER T-SLOT ON MACHINE TABLE AS A GUIDE.

THE TOE CLAMPS ARE POSITIONED AS SHOWN OPPOSITE ON FRONT AND BACK OF UNIT.

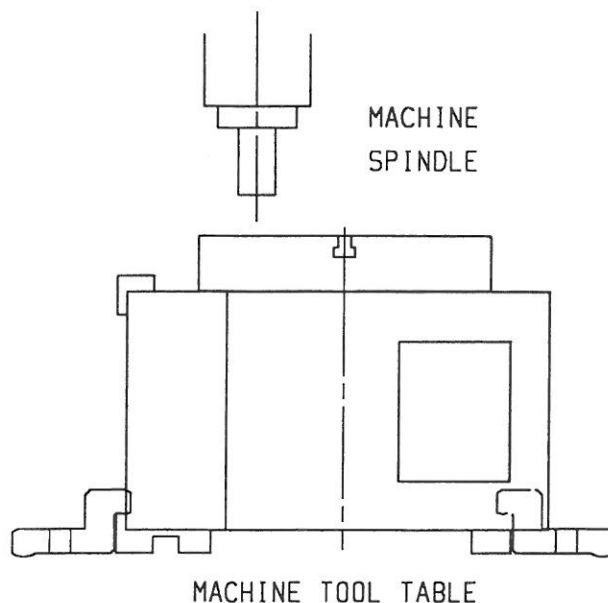
NOTE: T-NUTS AND BOLTS ARE NOT SUPPLIED WITH THE INDEXER SHIPMENT.



HORIZONTAL ORIENTATION



VERTICAL ORIENTATION



INSTALLATION

RT 375 - SMW CONTROL CONNECTIONS

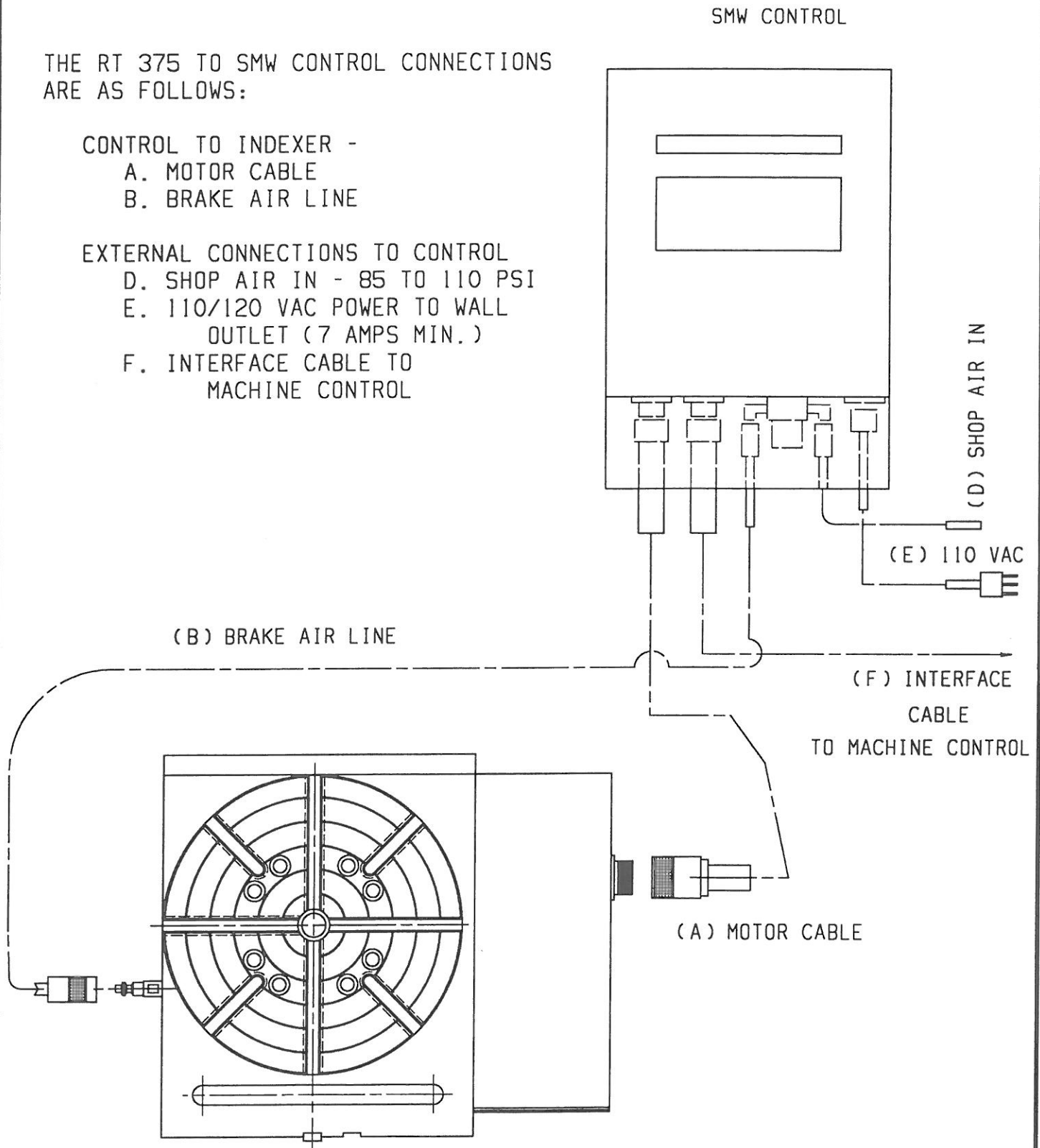
THE RT 375 TO SMW CONTROL CONNECTIONS ARE AS FOLLOWS:

CONTROL TO INDEXER -

- A. MOTOR CABLE
- B. BRAKE AIR LINE

EXTERNAL CONNECTIONS TO CONTROL

- D. SHOP AIR IN - 85 TO 110 PSI
- E. 110/120 VAC POWER TO WALL OUTLET (7 AMPS MIN.)
- F. INTERFACE CABLE TO MACHINE CONTROL



INSTALLATION

FIXTURE ALIGNMENT GUIDELINES

ANY MIS-ALIGNMENT OF THE FIXTURE TAILSTOCK OR END SUPPORT CAN CAUSE MISCELLANEOUS SERVO INDEXING ERRORS SUCH AS OVER-CURRENT OR FOLLOWING ERRORS.

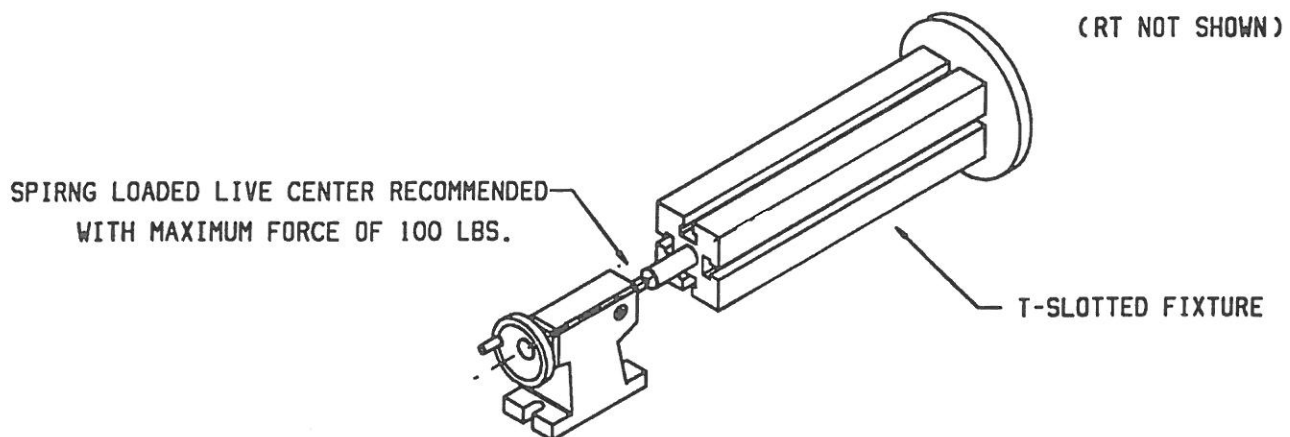
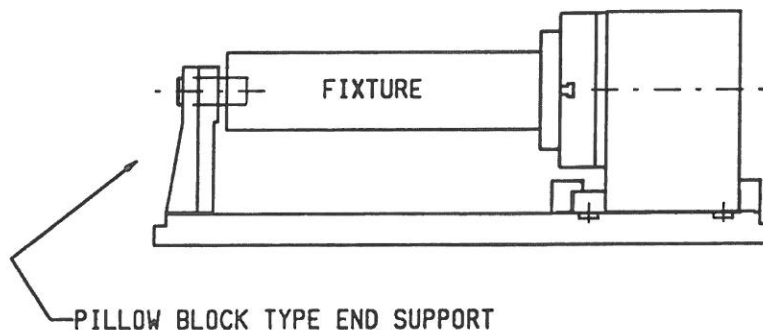
ALSO - THE SAME ERRORS CAN BE PRODUCED BY TOO MUCH AXIAL FORCE APPLIED BY THE TAILSTOCK TOWARD THE RT FACEPLATE.

FIXTURE AND END SUPPORT MIS-ALIGNMENT AND EXCESSIVE TAILSTOCK FORCE ADDS TO THE INDEXING LOAD OF THE MOTOR AND SERVO SYSTEM.

THE LONGER THE FIXTURE THE MORE CONCENTRIC THE INDEXING LOAD MUST BE TO THE SPINDLE AXIS OF THE INDEXER. AS THE LENGTH INCREASES, THE ALIGNMENT ERROR IS MAGNIFIED BY THE LONGER MOMENT ARM EFFECT OF THE LONGER FIXTURE.

TAILSTOCK OR END SUPPORT ALIGNMENT SHOULD BE LESS THAN .001 INCH IN ALL PLANES.

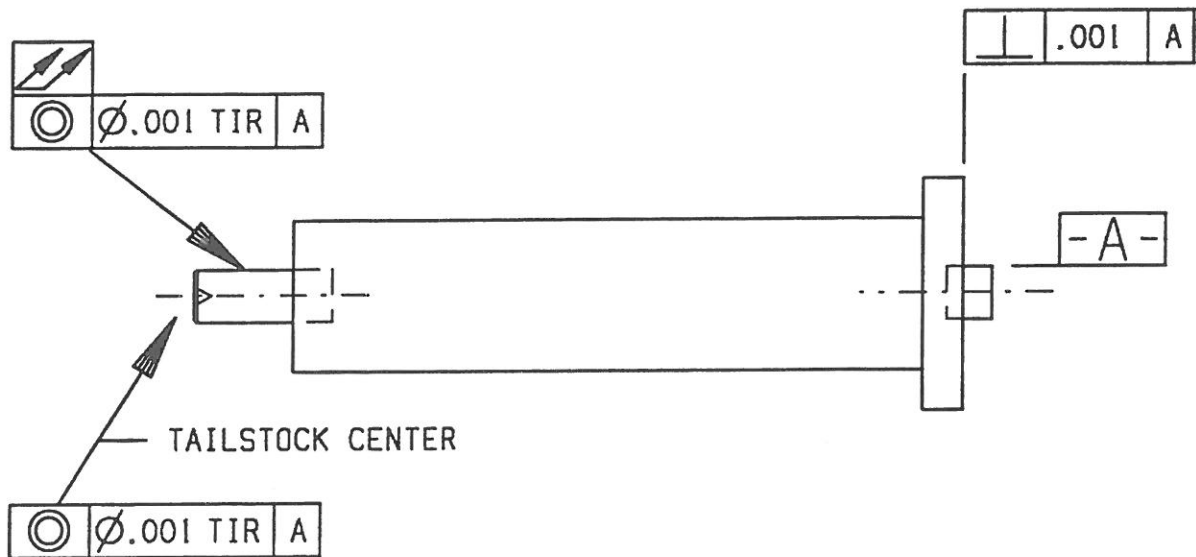
A SPRING LOADED-LIVE TAILSTOCK CENTER IS RECOMMENDED WITH MAXIMUM TAILSTOCK FORCE OF 100 POUNDS.



INSTALLATION

FIXTURE ALIGNMENT GUIDELINES

THE FOLLOWING FIXTURE RUNOUTS ARE RECOMMENDED TO REDUCE SERVO INDEXING ERRORS:



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Precautions.....	M-2.0

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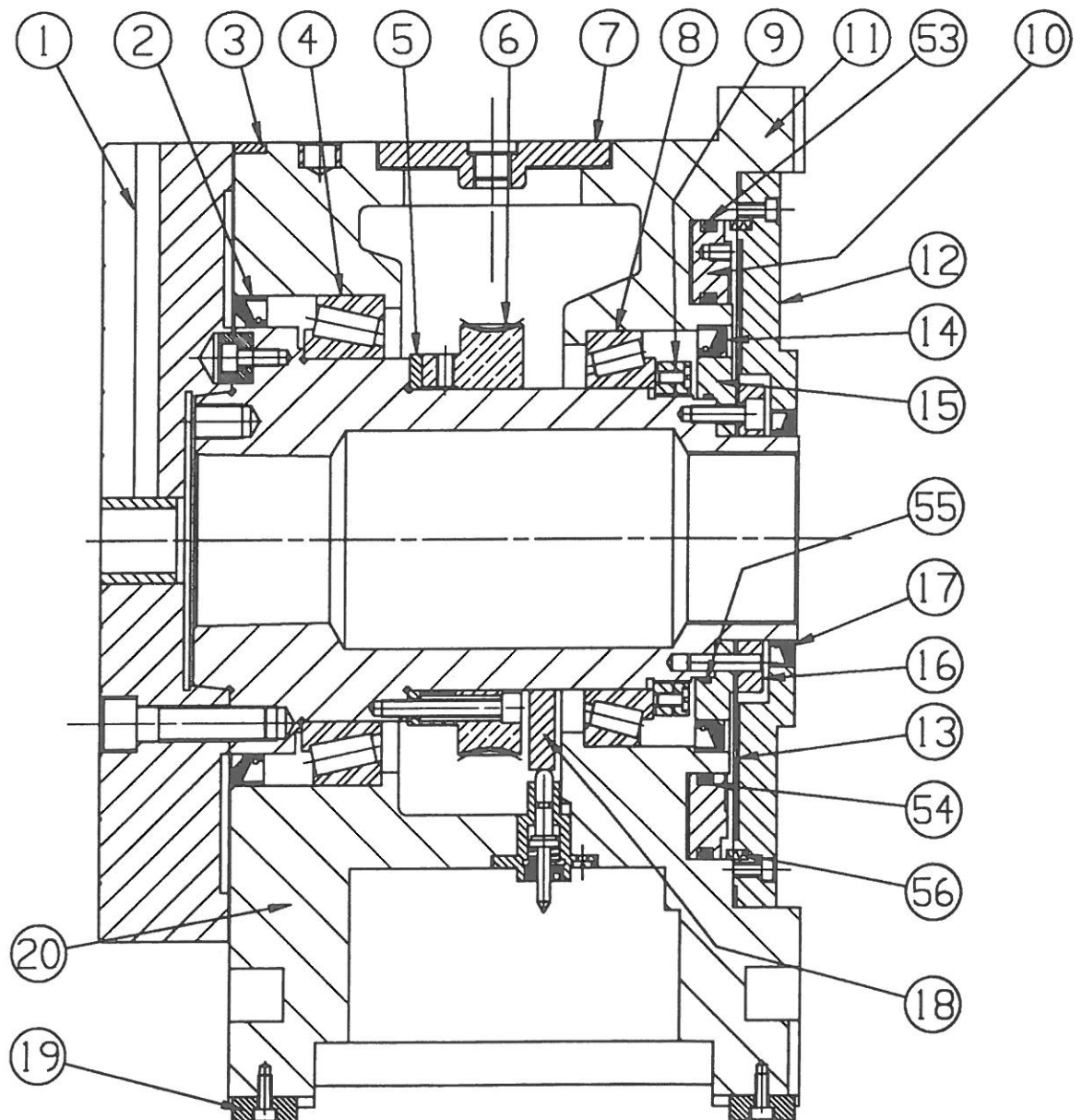
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MAINTENANCE-RT 375VN INDEXER

PARTS LIST - SPINDLE SECTION

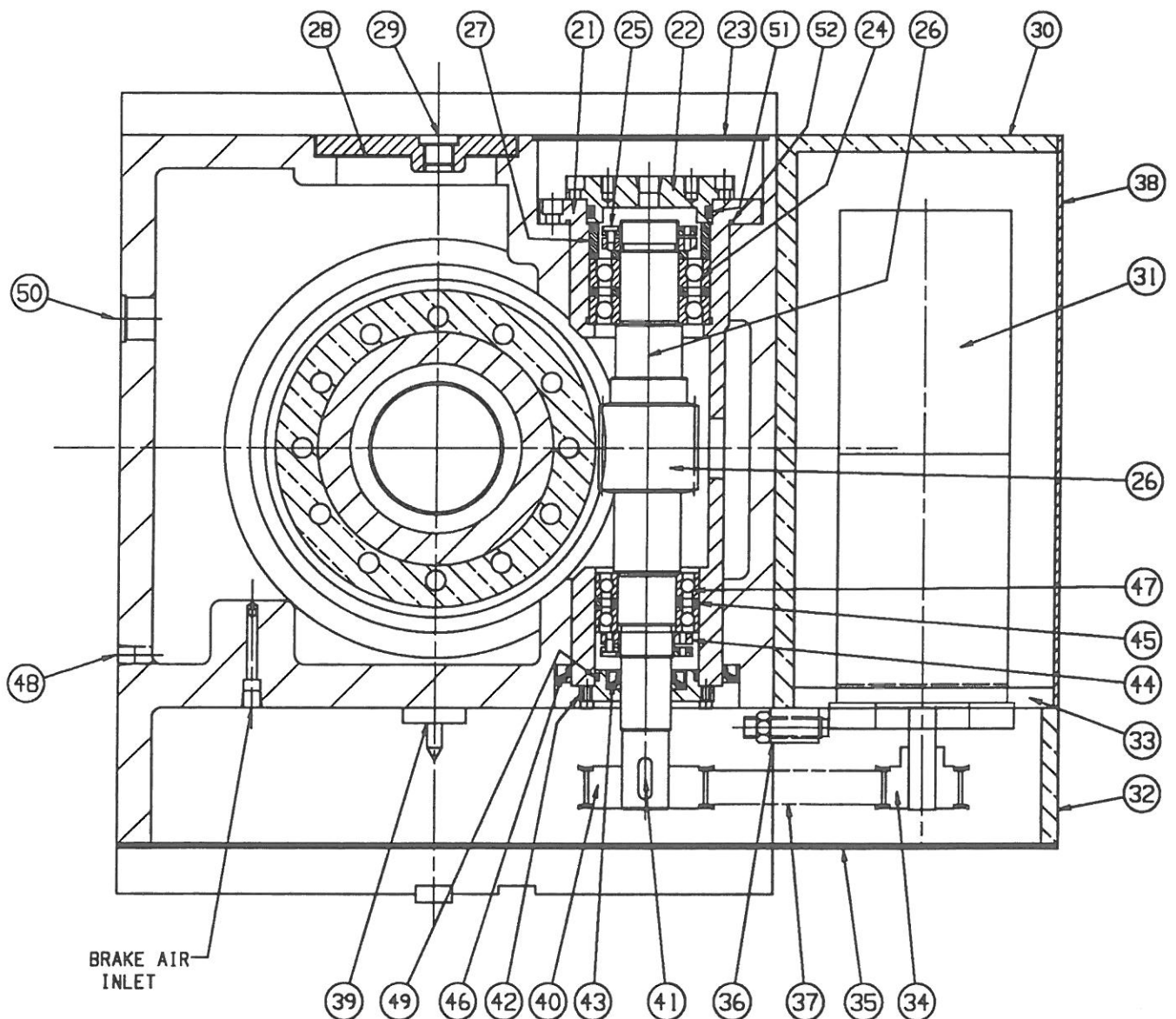
ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
1	1	FACEPLATE	13	1	DISC - BRAKE
2	1	SEAL - LIP	14	1	SEAL - LIP
3	1	INDICATOR - DEGREE	15	1	PLATE - DISC MOUNTING
4	1	BEARING - FRONT	16	1	RETAINER - DISC
5	1	SPACER - WORM GEAR	17	1	SEAL - LIP
6	1	WORMWHEEL	18	1	DOG - HOME REFERENCE
7	1	CAP- TOP W/PLUG	19	2	KEY - BASE
8	1	BEARING - REAR	20	1	SPINDLE
9	1	LOCK-NUT - BEARING ASSY.			
10	1	PISTON - BRAKE	53	1	O-RING
11	1	HOUSING - MAIN	54	1	O-RING
12	1	PLATE - BACK	55	1	O-RING
			56	8	SPRING - PISTON RETURN



MAINTENANCE-RT 375VN INDEXER

PARTS LIST - WORM SECTION

ITEM	QTY	DESCRIPTION	ITEM	QTY	DESCRIPTION
21	1	CARTRIDGE - ECCENTRIC WORM	37	1	BELT - TIMING
22	1	COVER - TOP WORM	38	1	PLATE - SIDE COVER
23	1	CAP - WORM BORE UPPER	39	1	ASSEMBLY HOME ACTUATOR
24	1	BEARING - WORM (SET)	40	1	PULLEY - WORMSHAFT
25	1	LOCK-NUT - ASSEMBLY	41	1	KEY
26	1	WORMSHAFT	42	1	CAP - LOWER WORMSHAFT
27	1	SPACER	43	1	SEAL - OIL LIP
28	1	GASKET - TOP COVER	44	1	ASSEMBLY LOCK-NUT
29	1	PLUG - TOP	45	1	SPACER
30	1	COVER - MOTOR	46	1	SEAL - OIL LIP
31	1	MOTOR	47	1	BEARING SET - WORM
32	1	HOUSING - LOWER PULLEY	48	1	PLUG - OIL DRAIN
33	1	PLATE - MOTOR MOUNTING	49	1	O-RING
34	1	PULLEY - MOTOR	50	1	GAUGE - OIL SIGHT
35	1	COVER - LOWER BELT	51	1	O-RING
36	1	BLOCK - BELT TENSION	52	1	O-RING



MAINTENANCE

BELT TENSIONING - RT375VN

TIMING BELTS SHOULD BE INSTALLED TO FIT PULLEYS SNUGLY, NEITHER TOO TIGHT NOR TOO LOOSE. THE BELT'S POSITIVE GRIP ELIMINATES THE NEED FOR HIGH INITIAL TENSION. WHEN A BELT IS INSTALLED WITH A SNUG FIT (THAT IS NOT TOO TAUT) LONGER LIFE, LESS WEAR ON BEARINGS, AND QUIETER OPERATION WILL BE ASSURED. OVERTENSIONING THE BELT CAN CAUSE PREMATURE FAILURE AND SHOULD BE AVOIDED.

TENSIONING INSTRUCTIONS:

PLACE THE BELT ON ITS PULLEYS AND ADJUST TENSIONING SCREW SO THAT THE BELT TEETH MESH SECURELY WITH PULLEY GROOVES.

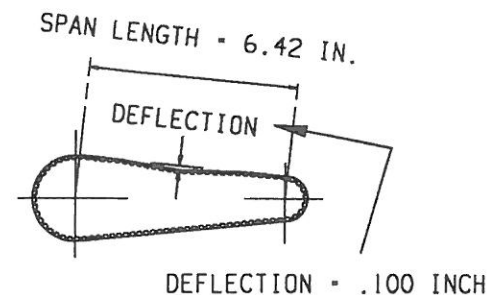
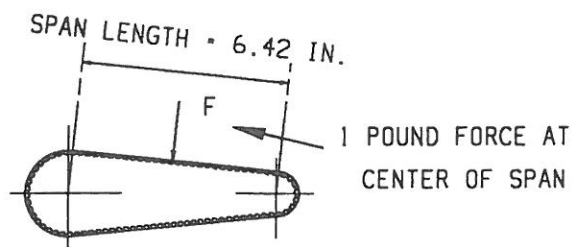
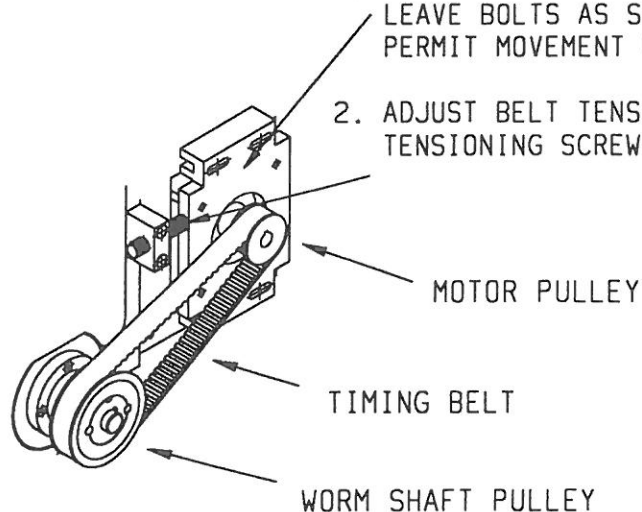
THEN TIGHTEN THE BELT SO THAT IT DEFLECTS 1/64 TH OF AN INCH FOR EACH INCH OF BELT SPAN WHEN A 1 POUND FORCE IS APPLIED AS SHOWN BELOW.

THE RT375VN HAS A BELT SPAN OF 6.42 INCH. THEREFORE, A 1 POUND FORCE WHEN APPLIED TO THE CENTER OF BELT SPAN SHOULD DEFLECT BELT .100 INCH.

REMOVE BOTTOM COVER TO EXPOSE BELT AND PULLEYS

1. LOOSEN MOTOR PLATE MOUNTING BOLTS - BUT LEAVE BOLTS AS SNUG BUT LOOSE ENOUGH TO PERMIT MOVEMENT OF MOTOR PLATE.

2. ADJUST BELT TENSION BY TURNING THE BELT TENSIONING SCREW SHOWN BELOW.



MAINTENANCE

LUBRICATION - OIL SPECIFICATIONS

THE SMW INDEXER IS A HIGH-PRECISION WORMGEAR SET CONSISTING OF A BRONZE IRON WORM WHEEL - A HARDENED STEEL WORM SCREW - AND PRECISION BEARINGS. FOR LONG LIFE AND PROPER OPERATION IT IS ESSENTIAL THAT THE INTERIOR OF THE GEAR BOX BE KEPT CLEAN AND FILLED WITH THE CORRECT LUBRICATION OIL.

ALTHOUGH THE INDEX TABLE IS WELL SEALED TO KEEP CONTAMINATION OUT AND OIL IN - THE OIL LEVEL AND CLEANLINESS SHOULD BE CHECKED REGULARLY. IT IS WISE PREVENTATIVE MAINTENANCE TO DRAIN THE OIL ONCE OR TWICE A YEAR AND REFILL WITH NEW OIL. IF THERE IS ANY EVIDENCE OF CONTAMINATION THE GEAR BOX SHOULD BE FLUSHED WITH CLEAN SOLVENT - THE SEALS CHECKED - AND REPLACED IF REQUIRED - AND MORE FREQUENT OIL CHANGES CONSIDERED.

THE LUBRICANT MUST BE A PREMIUM QUALITY HEAVY-DUTY INDUSTRIAL GEAR OIL FOR ENCLOSED GEAR SETS AND PROVIDE GOOD RUST AND CORROSION PROTECTION - OXIDATION STABILITY - FOAMING RESISTANCE AND PRESSURE CHARACTERISTICS WHICH MINIMIZE TEMPERATURE RISE.

RECOMMENDED OILS (OR EQUIVALENTS) ARE -

- TEXACO - MEROPA 150
- SHELL - OMALA 100
- MOBIL - MOBILGEAR 629

CHARACTERISTICS OF ABOVE OILS -

AGMA GRADE	4-EP
FLASH POINT	400 DEGREES FAHRENHEIT
ISO GRADE	100-150
SUS VISCOSITY	
AT 100 DEG. F.	725
AT 210 DEG. F.	75.5

NOTE: SMW INDEXERS ARE SHIPPED STANDARD WITH MOBILGEAR 629.

SINCE SOME OIL COULD BE LOST THROUGH THE SEALS THE OIL LEVEL SHOULD BE CHECKED WEEKLY OR EVEN MORE FREQUENTLY SHOULD YOU FIND IT NECESSARY TO ADD MUCH OIL AT THE WEEKLY CHECKS.

MAINTENANCE

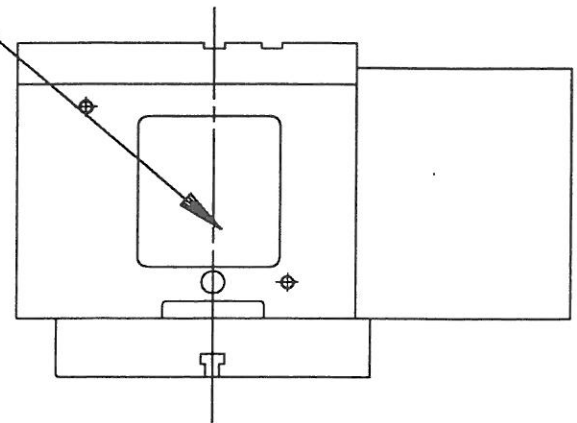
LUBRICATION - ADDING OIL TO UNIT

OIL IS ADDED TO THE INDEXER THROUGH THE ACCESS AT THE TOP OF THE UNIT THROUGH THE TOP OIL CAP.

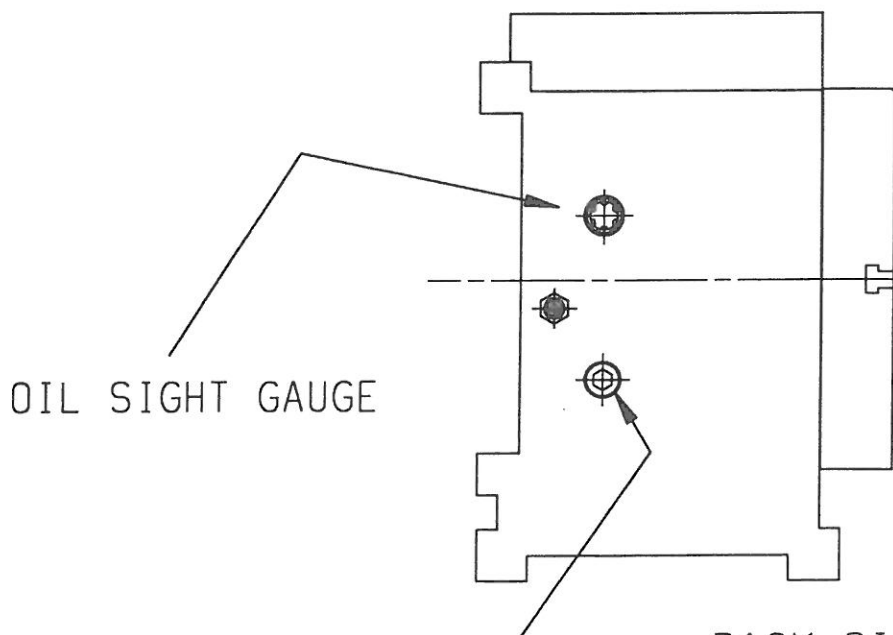
THE OIL LEVEL IS CHECKED BY VIEWING THE OIL LEVEL SIGHT GAGE ON SIDE OF THE UNIT.

OIL MUST BE KEPT IN CENTER OF SIGHT GAGE OR ABOVE. A SMALL AMOUNT OF OIL CAN BE TRAPPED IN BOTTOM OF SIGHT GAGE MAKING IT APPEAR THAT THE APPROPRIATE OIL LEVEL IS IN THE UNIT WHEN ACTUALLY THE OIL LEVEL MAY BE DANGEROUSLY LOW.

THE OIL LEVEL MUST BE KEPT AT SIGHT GAUGE HIEGHT OR ABOVE OR DAMAGE TO THE WORMGEAR WILL OCCUR.



TOP VIEW



OIL DRAIN PLUG

BACK SIDE VIEW

MAINTENANCE

BACKLASH ADJUSTMENT

ADJUST BACKLASH AS FOLLOWS:

- 1) REMOVE LOWER COVER TO EXPOSE PULLEYS, BELT, AND MOTOR MOUNTING SCREWS.
- 2) LOOSEN MOTOR MOUNTING SCREWS, RELEASE TENSION ON BELT, AND REMOVE BELT.
- 3) REMOVE WORMSHAFT PULLEY - LOOSEN TWO SET SCREWS ON PULLEY.
- 4) LOOSEN THE FOUR SCREWS IN ANGULAR SLOTS IN PERIMETER OF THE WORMSHAFT ECCENTRIC CARTRIDGE TOP FLANGE (ITEM 21) WHICH PERMITS WORMSHAFT ROTATION.
- 5) THE WORMSHAFT IS 5 MM (.19 INCH) ECCENTRIC TO THE WORMWHEEL.
TO BEST GET A "FEEL" FOR THE BACKLASH APPLY AIR PRESSURE TO THE INDEXER BRAKE AIR INLET SO THAT THE SPINDLE IS FIXED AND ROTATE THE WORMSHAFT CLOCKWISE AND COUNTER-CLOCKWISE.
CAUTION: WHEN APPLYING MANUAL TORQUE TO THE WORMSHAFT WITH THE BRAKE ENGAGED DO NOT APPLY MORE THAN 3.7 FT-LBS OF TORQUE TO THE WORMSHAFT. THE INDEXER HAS A BRAKE TORQUE OF 340 FT-LBS AND THE WORMWHEEL TO WORMSHAFT GEAR RATIO IS 90:1. EXCEEDING 3.7 FT-LBS INPUT TORQUE AT THE WORMWHEEL WILL "TURN" SPINDLE THROUGH THE BRAKE AND MAY DAMAGE BRAKE.
- 6) TO DECREASE BACKLASH - ROTATE THE ECCENTRIC CARTRIDGE COUNTER-CLOCKWISE TO INCREASE CLEARANCE BETWEEN THE WORMWHEEL AND WORMSHAFT.
- 7) TO INCREASE BACKLASH - ROTATE THE ECCENTRIC CARTRIDGE CLOCKWISE.
- 8) BACKLASH MUST BE SET AT THE TIGHTEST POINT AROUND THE WORMWHEEL.
AFTER THE BACKLASH IS RE-ADJUSTED - ROTATE THE INDEXER A FULL 360 DEGREES BY MANUALLY ROTATING THE WORMSHAFT TO DETERMINE IF THERE IS ANY BINDING OR TIGHT SPOTS AT ANY POINT FOR THE ENTIRE ENGAGEMENT OF THE WORMSHAFT AND WORMWHEEL.
IF A "TIGHT" AREA IS LOCATED - RE-ADJUST THE BACKLASH AT THIS "TIGHTEST" POINT OF ENGAGEMENT.
- 9) AFTER ADJUSTMENT - REVERSE THE DISASSEMBLY PROCEDURE ABOVE. (NOTE- PROPER BELT TENSIONING ADJUSTMENT AS ON PAGE IM-5.0)
- 10) NOTE: 30 SECONDS OF BACKLASH IS .00011 INCH OF "FREE" MOVEMENT OF THE FACEPLATE AT ITS OUTER EDGE (7.38 INCH RADIUS).
60 SECONDS OF BACKLASH IS .0022 INCH OF MOVEMENT.
- 11) CAUTION:
IT IS BETTER TO HAVE TOO MUCH BACKLASH THAN TOO LITTLE. IF TOO TIGHT THE WORMWHEEL WILL BE DAMAGED DURING ROTATION.
- 12) THE SMW SERVO CONTROL USES UNI-DIRECTIONAL BACKLASH COMPENSATION SO THE BACKLASH AT THE WORMSHAFT AND WORMWHEEL CAN BE AT 60 SECONDS OR A LITTLE MORE BECAUSE THE SMW CONTROL APPROACHES ALL INDEXING POSITIONS IN THE SAME "POSITIVE" DIRECTION.

